



Mycobacteriosis in Striped Bass

Mycobacteriosis is an emerging threat to the Chesapeake Bay striped bass and the fisheries it supports.



Striped Bass with Skin Lesions often appear as "skinny" or in poor condition

(Photo by L. Pieper, Maryland Dept. Natural Resources)

Mycobacteriosis is a bacterial disease in which striped bass (rockfish) may be disfigured as a result of skin ulcers and internal lesions. The bass may also be skinny or in extremely poor condition due to the chronic nature of this wasting disease. Stripers are a highly prized target species for both recreational anglers and commercial fishermen. As such, the economic impact of diseased and devalued fish could be significant. In addition, some of the mycobacteria that commonly infect fishes can cause infections in people and therefore are a human health concern. The total extent to which the disease is occurring along the Eastern seaboard is unknown but the

disease has been reported from stripers taken from the Chesapeake and Delaware Bays. During 1998-99, skin ulcers attributed to mycobacterial infection were observed in up to 50% of the striped bass from some Virginia tributaries of the Chesapeake Bay. Data obtained during the summer of 2001 from fish harvested in Virginia waters indicated



Mycobacteria colony

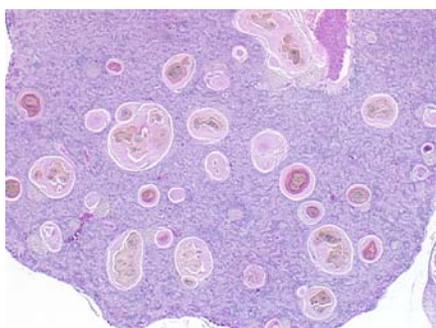
(Photo by M. Rhodes and H. Kator, Virginia Institute of Marine Science)

that, at least in some areas, up to 70% of striped bass may be infected with the mycobacteria that are associated with the disease. Given the persistence over the last 3 years of this mycobacteriosis outbreak, this does not appear to be a short-term problem.

What is unusual but significant about the current outbreak is the high prevalence of skin ulcers containing mycobacteria. Fish mycobacteriosis usually involves the internal organs only. Mycobacteria associated skin lesions have previously been reported only in situations where fish are held in highly stressful settings. The atypical form of mycobacteriosis currently being observed in striped

Current Research

- Partners and Co-operators: Maryland Department of Natural Resources, Virginia Institute of Marine Science, University of Maryland, U.S. Fish and Wildlife Service, Centers for Disease Control and Prevention, Atlanta
- Activities
 - Characterizing mycobacteria obtained from diseased Chesapeake Bay striped bass and standardizing laboratory methods.
 - Evaluating the striped bass immune response to mycobacteria.
 - Developing non-lethal sampling methods for determining mycobacterial infection status in striped bass.
 - Characterizing the age specific progression of mycobacteriosis in striped bass.



Striped bass spleen tissue with typical mycobacteria-associated pathology

(Photo by D. Gauthier, Virginia Institute of Marine Science)

bass may indicate that habitat or environmental conditions required for supporting this species at current population levels may not exist in the Bay. As long as the conditions that favor the development of mycobacteriosis exist, the disease is likely to persist in some portion of the striped bass populations.

Research needs to move forward in two areas. Relatively little is known about the incidence of mycobacteriosis within migratory striped bass populations occurring in the

eastern coastal region. The lack of information on age specific mortality associated with the disease and the effects on reproductive biology and spawning success make estimates of population impacts currently impossible.

Field studies are required in multiple east coast watersheds to help put the Chesapeake Bay outbreak into context and to better identify affected striped bass stocks. Additional fieldwork needs to be conducted in conjunction with existing Chesapeake Bay striped bass tagging-programs to provide estimates of population-level impacts. Once the *Mycobacterium* isolates obtained from diseased striped bass have been characterized and their ability to produce the observed diseased confirmed, the mechanisms involved in disease development and transmission can be determined. By



Striped Bass with internal mycobacteria-associated lesions.

(Photo by D. Gauthier, Virginia Institute of Marine Science)

understanding the dynamics of mycobacteriosis within striped bass populations and characterizing the disease mechanisms we should be able to identify points within the disease-development process where fisheries management tools (e.g. regulations on harvest times, gear use, etc.) can be used to reduce the spread of the disease in striped bass stocks and to minimize risks to fisherman.

